I (WE) CLAIM:

1. A method for adaptive grating lobe suppression in ultrasound processing, the method comprising:

(a) acquiring ultrasound data;

(b) determining a grating lobe level as a function of the ultrasound data; and

(c) altering processing in response to the grating lobe level.

2. The method of Claim 1 further comprising:

(d) filtering the ultrasound data with a band-pass filter prior to detection;

wherein (b) comprises determining the grating lobe level as a function of the filter input and filter output of (d).

3. The method of Claim 2 wherein (d) comprises performing the filtering after beamformation, the ultrasound data being beamformed data.

4. The method of Claim 2 wherein (d) comprises performing the filtering after application of beamforming delays and prior to channel summation, the ultrasound data being channel data.

5. The method of Claim 2 wherein (b) comprises determining a difference of the filter input and filter output.

6. The method of Claim 2 wherein (b) comprises determining a ratio of the filter input and filter output.

7. The method of Claim 2 wherein (c) comprises outputting a weighted summation of the filter input and filter output where the weights are a function of the grating lobe level.

9. The method of Claim 7 further comprising:

(e) displaying an image as a function of the weighted summation output.

10. The method of Claim 7 wherein the weights are one of: (c1) 1 for the filter input and 0 for filter output and (c2) 0 for the filter input and 1 for filter output

11. The method of Claim 2 wherein (c) comprises modulating a gain as a function of the grating lobe level.

12. The method of Claim 2 wherein (d) comprises filtering with the bandwidth of the band-pass filter being narrower than a bandwidth of the ultrasound data and a center frequency of the band-pass filter being lower than a center frequency associated with the ultrasound data.

13. The method of Claim 1 wherein (a), (b) and (c) are performed separately for a plurality of locations within a scanned region.

14. The method of Claim 13 wherein at least one of (b) and (c) are varied as a function of at least one of steering angle and range.

15. The method of Claim 1 wherein (b) comprises determining similarity of signals from two different transducer elements and (c) comprises altering a phase of a sum of the signals from the two different transducer elements, the altering being a function of an amount of correlation.

16. The method of Claim 15 wherein (b) comprises determining whether a peak correlation occurs closer to no shift between the signals from the two different transducer elements than a period shift between the signals from the two different transducer elements, the no shift and period shift being for the signals after application of any beamforming delays.

17. The method of Claim 15 wherein (c) comprises selecting one of: shifting the sum by 180 degrees and applying no shift as a function of the amount of correlation.

18. The method of Claim 17 wherein (c) comprises multiplying by negative one when the amount of correlation indicates energy from a grating lobe and multiplying by positive one when the amount of correlation indicates energy from a main lobe.

19. The method of Claim 15 wherein (a) comprises acquiring the ultrasound data after application of beamforming delays and prior to channel summation, the ultrasound data being channel data.

20. The method of Claim 19 wherein (a) comprises acquiring the ultrasound data from a sparse spacing of the two different transducer elements;

further comprising:

(d) forming a virtual element signal as the sum; and

(e) beamforming with the acquired ultrasound data and the virtual element signal.

21. The method of Claim 1 wherein (b) and (c) comprises adaptively rejecting grating lobe energy in beamforming as a function of an object field being scanned.

22. The method of Claim 1 wherein (b) comprises determining an amount of grating lobe energy in the ultrasound data and (c) comprises reducing an amount of grating lobe clutter in image signals.

23. A system for adaptive grating lobe suppression in ultrasound processing, the system comprising:

an ultrasound transducer; and

a processor connected with the ultrasound transducer, the processor operable to determine a level of grating lobe clutter in ultrasound data from the

ultrasound transducer and operable to alter processing in response to the level of grating lobe clutter.

24. The system of Claim 23 wherein the ultrasound transducer comprises a sparsely sampled array of elements; and

wherein the processor is operable to correlate signals from two different transducer elements and altering a phase of a sum of the signals from the two different transducer elements, the altering being a function of an amount of correlation.

25. The system of Claim 23 wherein the processor comprise a band-pass filter operable to filter the ultrasound data prior to detection, the level of grating lobe clutter determined as a function of the ultrasound data input to the filter and filtered ultrasound data output from the filter.

26. A method for adaptive grating lobe suppression in ultrasound processing, the method comprising:

(a) measuring a level of grating lobe energy from received ultrasound data; and

(b) adapting data processes to reduce the level of grating lobe energy in the received ultrasound data.

27. The method of Claim 26 wherein (a) comprises correlating signals from two different transducer elements and (b) comprises adapting a phase shift as a function of a temporal shift maximizing the correlation of (a).

28. The method of Claim 26 wherein (a) comprises:

(a1) filtering with a filter having a lower center frequency than for the received ultrasound data; and

(a2) comparing the received ultrasound data with filtered ultrasound data responsive to the filter; and

wherein (b) comprises one of:

(b1) modulating a gain as a function of the comparison of (a2); and

(b2) selecting one of the received ultrasound data, the filtered ultrasound data and combinations thereof as a function of the comparison of (a2).

29. The method of Claim 1 wherein (b) comprises determining similarity of signals from two different transducer elements and (c) comprises setting a gain for one of the two different transducer elements as a function of the similarity

30. The method of Claim 29 wherein (c) comprises setting the gain to zero for high grating lobe content.

31. The method of Claim 29 wherein (c) comprises setting the gain for both of the two different transducer elements as a function of the similarity.